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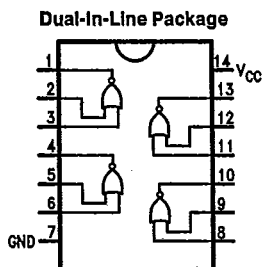
LS28

54LS28/DM74LS28 Quad 2-Input NOR Buffer

General Description

The 'LS28 contains four independent gates each of which perform the logic NOR function.

Connection Diagram



TL/F/10169-1

Order Number 54LS28DMQB, 54LS28FMQB, 54LS28LMQB,
DM74LS28M or DM74LS28N
See NS Package Number E20A, J14A, M14A, N14A or W14B

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Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	
54LS	-55°C to +125°C
DM74LS	0°C to +70°C
Storage Temperature Range	-65°C to +150°C

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Note: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Recommended Operating Conditions

Symbol	Parameter	54LS28			DM74LS28			Units
		Min	Nom	Max	Min	Nom	Max	
V _{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V _{IH}	High Level Input Voltage	2			2			V
V _{IL}	Low Level Input Voltage			0.7			0.8	V
I _{OH}	High Level Output Current			-1.2			-1.2	mA
I _{OL}	Low Level Output Current			12			24	mA
T _A	Free Air Operating Temperature	-55		125	0		70	°C

Electrical Characteristics over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
V _I	Input Clamp Voltage	V _{CC} = Min, I _I = -18 mA			-1.5	V
V _{OH}	High Level Output Voltage	V _{CC} = Min, I _{OH} = Max, V _{IL} = Max	54LS 2.5			V
			DM74 2.7			
V _{OL}	Low Level Output Voltage	V _{CC} = Min, I _{OL} = Max, V _{IH} = Min	54LS 0.4		0.4	V
			DM74 0.5		0.5	
		I _{OL} = 12 mA, V _{CC} = Min	DM74 0.4		0.4	
I _I	Input Current @ Max Input Voltage	V _{CC} = Max, V _I = 10V			0.1	mA
I _{IH}	High Level Input Current	V _{CC} = Max, V _I = 2.7V			20	μA
I _{IL}	Low Level Input Current	V _{CC} = Max, V _I = 0.4V			-0.4	mA
I _{OS}	Short Circuit Output Current	V _{CC} = Max (Note 2)	54LS -30		-130	mA
			DM74 -30		-130	
I _{CC}	Supply Current with Outputs High	V _{CC} = Max			3.6	mA
I _{CC}	Supply Current with Outputs Low	V _{CC} = Max			13.8	mA

Note 1: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 2: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Switching Characteristics

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at $V_{CC} = +5.0V$, $T_A = +25^{\circ}C$ (See Section 1 for test waveforms and output load)

Symbol	Parameter	$R_L = 2\ k\Omega$ $C_L = 15\ pF$		Units
		Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output		20	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		20	ns

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